can be afforded against the specific types of pneumococci used in the vaccine. No cases of the types against which Lister vaccinated occurred over a period of nine months. Experiments made before the inoculation demonstrated the production of agglutinins and the protection the serum of vaccinated individuals conferred on mice. The total dosage to each man was six to nine billions each of dead pneumococci, types I and II, and four and a half to six billions, type III, this given in three or four doses at weekly intervals. The first inoculation contained one billion of each type. The constitutional reactions were slight, only twenty-five men of the entire number vaccinated being sufficiently ill to remain in quarters or the hospital. Those upset by the first or second inoculation usually received no further injections. A small percentage developed tender, painful infiltrations at the site of injection which progressed favorably without surgical treatment. Since the work at Camp Upton, CECIL and VAUGHAN (*Jour. Exper. Med.*, 1919, xxix, 457) vaccinated 13,460 men at Camp Wheeler against pneumococcus infection, using a lipovaccine. By this method one inoculation was sufficient. The dose consisted of 1 c.c. of an oily suspension containing ten billion each of pneumococci of types I, II and III. The local reactions were less than those produced by the saline vaccine. During three months' period of observation the incidence rate of pneumonia of all types among the vaccinated troops was less than one-half that among the unvaccinated. However, 32 cases of pneumonia of the types contained in the vaccine occurred, but of these 24 cases developed within one week of vaccination. These were considered to have occurred before immunity was established. The remaining eight cases were secondary to influenza.

Studies on Tuberculous Infection.—By the use of a strain of tubercle bacilli of the human type of relatively low virulence, KRAUSE (*Am. Review of Tuberculosis*, 1919, iii, 1) has been able to report some interesting facts in man and animals. He used the strain known as Ri, which Dr. Trudeau isolated in 1891. At the time of isolation it exhibited standard virulence for guinea-pigs, but gradually underwent a diminution in degree of infectivity, reaching a point from which it has never varied one way or another in the past twenty years. By inoculating guinea-pigs with Ri it was possible to produce a series of conditions which are in many respects comparable to those obtaining in most human beings suffering tubercular infection. The infection with Ri is slow in developing and does not bring about an advanced tuberculization of the entire body, nor did it ever bring about the death of the animal. The animals were allowed to live for two years and more, and were invariably in perfect physical condition during that time. No gross visceral lesions were found and but slightly altered regional lymphatic nodes. These latter when sectioned always revealed tubercles, usually of a sclerotic type, with central necrosis and caseation. The tracheobronchial nodes had enlarged more than the regionary nodes of the same animals and the lesions were of a more advanced type, suggesting infection by way of the respiratory tract instead of subcutaneously. Not the slightest change was to be found in the lungs. The author believes that a similar localization occurs in human beings, that is, the tracheobronchial nodes showing evidence of infection and the lungs remaining clear. Cornet's work substantiates that of the author's when he found that inhalation of attenuated bacilli in dust set up manifest tubercle in the tracheobronchial nodes, although none were detectable in the lungs. There are many interesting problems involved in such a study, and the author gives his general result in the hope that it may throw some light on the various disputed and important phases of tubercular infection. The resistance of various tissues to the invasion of the tubercle bacillus must be studied and fully appreciated. Also, the peculiar anatomy of the lungs in experimental animals and the human must be carefully considered when drawing conclusions from experiments. This latter point has not received sufficient notice and may aid in solving the great problem of what we may call the "natural" mode of pulmonary infection in human beings, which at present is still in a purely speculative stage.

An Experimental Study of Vaccination against Bacilli Dysenteriæ.—Following upon the development of typhoid and paratyphoid vaccines suspended in vegetable oils by Le Moignic and Pinoy and by Tribondeau OLITSKY (*Jour. Exper. Med.*, 1918, xxviii, 69) applied this method of suspension to dysentery vaccine (B. dysenteriæ, Shiga and Flexner), with a view to lessening the intensity of the local and systemic reactions produced by saline vaccines of the same organisms. The exact nature of the oils not as yet having been revealed by the French investigators, he experimented first with rabbits, using various oily vehicles for his vaccine. Olive oil saturated with lanolin proved unsatisfactory. Filtering the "lipovaccin" of Le Moignic and Pinoy through a Berkefeld filter and using the filtrate as a vehicle eliminated the toxic reactions. Almond oil used alone as a vehicle also proved satisfactory in rabbits, giving no systemic reaction and a small local reaction. The degree of protection received was as high as that with saline vaccines, this protection remaining practically undiminished for a month; rabbits at this time were protected against ten lethal doses of a Shiga culture and four lethal doses of a Flexner culture injected intravenously. In his experiments with eight men he found that a single injection of a neutralized almond-oil vaccine, 0.5 c.c., containing 2½ billion bacilli, equal parts of Flexner and Shiga, resulted in slight or no systemic reaction and only a moderate local reaction. Agglutination appeared about the seventh day and lasted for at least a month. The slower rate of absorption seems to be responsible for the lessened reaction, the writer showing that while a saline vaccine disappears from the site of injection in twenty-four hours an oily vaccine does not disappear until after the third day.

Rocky Mountain Spotted Fever in the Domestic Rabbit.—The first studies of "tick fever" carried on by Wilson and Chowning indicated that the tick was the medium of transmission, and described a piroplasma in the blood. King and Ricketts confirmed the finding that the disease is transmitted by the tick; but they as well as Stiles (1905) failed to find the organism in the blood. While Stiles had doubted the susceptibility of the domestic rabbit to Rocky Mountain spotted fever, Rucker (1912) reported that rabbits suffered from only a very mild form of the disease. Ricketts and Comez, in a brief publication, asserted that the rabbit was not susceptible to the ordinary virus but